

We claim:

- 5 1. A process for preparing polyoxymethylene by contacting a formaldehyde source with a catalyst of the formula I



10 where

M is Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Os, Co, Rh or Ir,

15 Cp is a cyclopentadienyl ligand $\text{C}_5\text{H}_{(5-u)}\text{R}^1_u$, where

u is from 0 to 5 and

20 R^1 is alkyl, alkenyl, aryl, heteroaryl, aralkyl, COOR^2 , COR^2 , CN or NO_2 , and

R^2 is H, alkyl, aryl or aralkyl,

25 v is 1 or 2,

each L is independently a nitrile, CO or a ligand displaceable by CO,

30 w is an integer from 0 to 4,

Z is an anion, and

m and n are each independently an integer from 1 to 3.

- 35 2. A process as claimed in claim 1 where

Cp is a cyclopentadienyl ligand $\text{C}_5\text{H}_{(5-u)}\text{R}^1_u$, where

40 R^1 is methyl, CHO, COCH_3 , COC_2H_5 , COOCH_3 , COOC_2H_5 , CN or NO_2 .

ART 34 AMDT Translation of amended sheets annexed to the IPER

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3. A process as claimed in any of the preceding claims where M is Mo or W.
4. A process as claimed in any of the preceding claims where each L is selected independently from nitriles, CO, alkenes, phosphines, amines, ethers, carboxylic esters, cyclic carbonic esters, epoxides, hemiacetals, acetals and nitro compounds.
- 10 5. A process as claimed in any of the preceding claims where Z is a halide, sulfonate of the formula OSO₂R, where R is alkyl, partially or fully halogenated alkyl or aryl, carboxylate, complexed borate, complexed phosphate, complexed arsenate or complexed antimonate.
- 15 6. A process as claimed in claim 5 where Z is chloride, acetate, trifluoroacetate or trifluoromethanesulfonate.
- 20 7. A process as claimed in any of the preceding claims where the formaldehyde source is formaldehyde, trioxane or paraformaldehyde.
8. A catalyst of the formula Ia
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$$\left[\text{CpM}(\text{CO})_2\text{L} \right]^+ \text{Z}^{\frac{n-}{1/n}} \quad (\text{Ia})$$
- where
- M is Mo or W,
- 30 Cp is a cyclopentadienyl ligand C₅H₄R¹ or C₅H₃R¹₂, where R¹ is CHO, COCH₃, COOCH₃ or COOC₂H₅,
- L is CO or CH₃CN,
- 35 Z is trifluoromethanesulfonate, trifluoroacetate, tetrafluoroborate, hexafluorophosphate or hexafluoroantimonate and
- 40 n is an integer from 1 to 3.
9. A catalyst as claimed in claim 8 where
- 45 Cp is a cyclopentadienyl ligand C₅H₄R¹ where R¹ is CHO, COCH₃ or COOCH₃ or is a cyclopentadienyl ligand C₅H₃R¹₂ where R¹ is COOC₂H₅.